

Serial No. 10/029021

2

(V200-0833) VGT 0206 PA

In the Claims:

1. (Currently Amended) A simulated steering assembly comprising:
a flexible polymer steering column shaft having a fixed end and a free rotational end; and
a control feature in communication with said free rotational end;
said control feature axially twisted said flexible polymer steering column shaft when rotated, said FPSCS elastically twisting.
2. (Original) A simulated steering assembly as described in claim 1 wherein said control feature is a steering wheel.
3. (Currently Amended) A simulated steering assembly as described in claim 1 further comprising:
an electroactive assembly in communication with said flexible polymer steering column shaft; and
a (steer-by-wire) control module in electronic communication with said electroactive assembly.
4. (Original) A simulated steering system assembly as described in claim 3 wherein said electroactive assembly comprises at least one sensor.
5. (Original) A simulated steering system assembly as described in claim 3 wherein said electroactive assembly comprises at least one piezoceramic device.
6. (Currently Amended) A simulated steering assembly as described in claim 3 wherein said electroactive assembly can adjust the modulus of said flexible polymer steering column shaft by altering the mechanical properties of said flexible polymer steering column shaft.

Serial No. 10/029021

3

(V200-0833) VGT 0206 PA

7. (Original) A simulated steering assembly as described in claim 3 wherein said electroactive assembly imparts road feel on said flexible polymer steering column shaft.

8. (Original) A simulated steering assembly as described in claim 3 wherein said electroactive assembly is embedded in said flexible polymer steering column shaft.

9. A simulated steering assembly comprising:
a flexible polymer steering column shaft having a fixed end and a rotationally free end;

a steering wheel in communication with said rotationally free end, said steering wheel axially twisting said flexible polymer steering column shaft when rotated such that said flexible polymer steering column shaft elastically twists; and

an electroactive assembly in communication with said flexible polymer steering column shaft.

10. (Currently Amended) A simulated steering assembly as described in claim 9 further comprising:

steering mechanisms; and

a steer-by-wire control module in electronic communication with said electroactive assembly and controlling said steering mechanisms in response to signals from said electroactive assembly.

11. (Original) A simulated steering assembly as described in claim 9 wherein said electroactive assembly comprises at least one sensor.

12. (Original) A simulated steering assembly as described in claim 9 wherein said electroactive assembly comprises at least one piezoceramic device.

13. (Original) A simulated steering assembly as described in claim 9 further comprising:

Serial No. 10/029021

4

(V200-0833) VGT 0206 PA

at least one guide element in communication with said flexible polymer steering column shaft and minimizing non-rotational deflections of said flexible polymer steering column shaft.

14. (Original) A simulated steering assembly as described in claim 9 wherein said electroactive assembly can adjust the modulus of said flexible polymer steering column shaft.

15. (Original) A simulated steering assembly as described in claim 9 wherein said at least one sensor element senses a degree of twist of said flexible polymer steering column shaft.

16. (Original) A simulated steering assembly as described in claim 9 wherein said electroactive assembly imparts road feel on said flexible polymer steering column shaft.

17 (Currently Amended) A method of controlling a steer-by-wire assembly utilizing a control feature and a flexible polymer steering column shaft having a fixed end and a free rotational end comprising;

rotating the free rotational end in response to a driver moving said control feature;

measuring the rotation of the flexible polymer steering column shaft using an electroactive assembly in communication with said flexible polymer steering column shaft; and

activating a steer-by-wire steering mechanism in response to said electroactive assembly.

18. (Original) A method as described in claim 17 further comprising:

adjusting the modulus of said flexible polymer steering column shaft utilizing said electroactive assembly to provide feedback to said driver.

19. (Original) A method as described in claim 17 further comprising:

Serial No. 10/029021

5

(V200-0833) VGT 0206 PA

removing modal resonances of said flexible polymer steering column shaft utilizing said electroactive assembly.

20. (Original) A method as described in claim 17 wherein said electroactive assembly includes a solid polymer composite bundle embedded in said flexible polymer steering column shaft.